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TOKYO, JAPAN

March 30, 2009

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Attention: Mr. Jeffrey A. Ciocco

Docket No. 52-021
MHI Ref: UAP-HF-09128

Subject: MHI's Responses to US-APWR DCD RAI No. 248-2178 Revision 1

Reference: [1] "Request for Additional Information No. 248-2178 Revision 1, SRP Section: 09.01.02 – New and Spent Fuel Storage - Design Certification and New License Applicants, Application Section: 9.1.2," dated December 18, 2008.

With this letter, Mitsubishi Heavy Industries, Ltd. ("MHI") transmits to the U.S. Nuclear Regulatory Commission ("NRC") a document entitled "Response to Request for Additional Information No. 248-2178 Revision 1".

Enclosure 1 is the responses to 3 questions that are contained within Reference [1].

Please contact Dr. C. Keith Paulson, Senior Technical Manager, Mitsubishi Nuclear Energy Systems, Inc. if the NRC has questions concerning any aspect of the submittals. His contact information is below.

Sincerely,

Y. Ogata

Yoshiki Ogata,
General Manager- APWR Promoting Department
Mitsubishi Heavy Industries, LTD.

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NRO

Enclosures:

1. Responses to Request for Additional Information No. 248-2178 Revision 1

CC: J. A. Ciocco
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Docket No. 52-021
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Enclosure 1

UAP-HF-09128
Docket No. 52-021

Responses to Request for Additional Information
No. 248-2178 Revision 1

March 2009

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

3/30/2009

US-APWR Design Certification

Mitsubishi Heavy Industries, Ltd.

Docket No. 52-021

RAI NO.: **NO. 248-2178 REVISION 1**

SRP SECTION: **9.1.2 – New and Spent Fuel Storage**

APPLICATION SECTION: **9.1.2**

DATE OF RAI ISSUE: **3/2/2009**

QUESTION NO.: 09.01.02-18

Requested Information
What special preparation is made for surfaces in the spent fuel pit to ensure that (1) corrosion products and fission products do not accumulate, (2) surfaces can be easily decontaminated, and (3) fuel assemblies will not be damaged?

Background
GDC 61 requires facility design to minimize corrosion in basic structures and buildup of crud or debris that could impede coolant flow. In order to ensure this, ANSI/ANS-57.2 recommends that the liner surface be selected to minimize accumulation of fission and corrosion products and ease surface decontamination (Sect. 6.1.2.10). It also recommends that storage rack surfaces meet smoothness limits and be free of sharp protrusions or corners that would damage fuel assemblies (Sect. 6.4.2.11). The applicant should address how these recommendations are met.

ANSWER:

The Spent Fuel Pit (SFP) is lined with 304 grade stainless steel. The liner surfaces have a 2B finish or higher and are selected to minimize accumulation of corrosion and fission products, and also provide easy maintenance and decontamination. The liner surface is smooth and non-porous to avoid buildup of radioactive material. DCD Section 9.1.2.2.2 on "Spent fuel storage" will be updated to add this detail.

The New and Spent Fuel Storage Racks for the US-APWR are specified to have all cell surfaces contacting fuel assemblies during loading and storage to be free of burrs, sharp corners, edges and weld beads or splatter which could mar or damage the fuel assembly surfaces; thus assuring The fuel assemblies will not be damaged during the normal fuel handling and storage process.

Impact on DCD

Add following as 2nd paragraph to DCD Section 9.1.2.2.2 on "Spent fuel storage";

"The Spent Fuel Pit (SFP) is lined with stainless steel. The liner surface will have a 2B or higher finish, selected to minimize accumulation of corrosion and fission products, and also provide easy

maintenance and decontamination. This liner surface is smooth and non-porous to avoid buildup of radioactive material."

Impact on COLA

There is no impact on the COLA

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

3/30/2009

US-APWR Design Certification

Mitsubishi Heavy Industries, Ltd.

Docket No. 52-021

RAI NO.: NO. 248-2178 REVISION 1

SRP SECTION: 9.1.2 – New and Spent Fuel Storage

APPLICATION SECTION: 9.1.2

DATE OF RAI ISSUE: 3/2/2009

QUESTION NO.: 09.01.02-19

Requested Information

1. How often will the SFP water be sampled?
2. What limiting value will be allowed for SO4 in SFP water?
3. How will Si and radionuclide concentrations be monitored?

Background

GDC 61 requires facility design to minimize corrosion in basic structures and buildup of crud or debris that could impede coolant flow. In order to ensure this, ANSI/ANS-57.2 recommends control of water chemistry to limit corrosion (6.3.2.9.2) and to remove dissolved and particulate radionuclides (6.3.2.15). In addition, the EPRI guidelines represent industry best practices in meeting the requirements of GDC 61. These guidelines give sampling frequencies for Si, Cl, F, SO4, turbidity, and gamma, and also recommended limits for Cl, F, and SO4. The DCD does not give any sampling frequencies, does not state any limits for SO4, and does not mention silica or gamma measurements at all.

ANSWER:

1.and 2.

Chemistry controls are implemented to maintain SFP water clarity, minimize dissolved and airborne activity and minimize corrosion of stored fuel assemblies and of construction materials. The SFP water will be monitored weekly for concentrations of boron, chloride, fluoride, and sulfate ions and turbidity. Silica will be monitored monthly. The DCD will be revised to add the limits and sampling frequencies for the SFP water chemistry speciation. The chemistry parameters suggested for monitoring included herein are from the EPRI Pressurized Water Reactor Primary Water Chemistry Guidelines.

3.

A dedicated silica analyzer will be utilized to confirm silica limits are met by SFP water sampling on a monthly basis. There are no direct measurements for radionuclide concentration in the SFP water. However, the demineralizers with a decontamination factor of 100 and filters make certain that these radionuclides are removed from the SFP water to the extent that the resulting water surface dose does not exceed 2.5 mrem/hr. Radiation levels in the SFP area are continuously monitored by the SFP area radiation monitors.

Impact on DCD

The DCD Table 9.1.3-1 on "Recommended Spent Fuel Pit Water Chemistry Speciation" will be replaced with the following table to add the limit for SO_4 and sampling frequencies for Si, Cl, F, SO_4, turbidity, and gamma isotopics.

Table 9.1.3-1 Recommended Spent Fuel Pit Water Chemistry Speciation and Sampling Frequencies

Analyzer		Unit	Standard value	Limit value	Sampling Frequency
1	Boron	ppm	-	≧ 4000	1/Week
2	Chloride ion	ppm	≦ 0.05	≦ 0.15	1/Week
3	Fluoride ion	ppm	≦ 0.05	≦ 0.15	1/Week
4	Sulfate	ppm	≦ 0.5	≦ 0.15	1/Week
5	Silica	ppm	≦ 1.0	≦ 1.5	1/Month
6	Turbidity	ppm	≦ 0.5	-	1/Week
7	Gamma Isotopics	μCi/ml	-	-	Continuous

Impact on COLA

There is no impact on the COLA

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

3/30/2009

US-APWR Design Certification

Mitsubishi Heavy Industries, Ltd.

Docket No. 52-021

RAI NO.: NO. 248-2178 REVISION 1

SRP SECTION: 9.1.2 – New and Spent Fuel Storage

APPLICATION SECTION: 9.1.2

DATE OF RAI ISSUE: 3/2/2009

QUESTION NO.: 09.01.02-20

Requested Information

1. Describe the materials of construction for storage racks in the new fuel storage area.

2. Describe the environment in the new fuel storage area, any corrosives that may arise, and how they would be controlled.

Background

GDC 61 requires facility design to minimize corrosion in basic structures and buildup of crud or debris that could impede coolant flow. The applicant mentions that rack materials in the new fuel storage pit are corrosion-resistant, but does not supply sufficient details about the materials or the possibilities for corrosives in the airspace.

ANSWER:

Storage racks in the new fuel storage area are designed of austenitic stainless steel. The new fuel storage is maintained dry and free of corrosion; there is no credible means of introduction of any corrosives to the environment of the new fuel storage area.

Impact on DCD

There is no impact on the DCD

Impact on COLA

There is no impact on the COLA

Impact on PRA

There is no impact on the PRA.